REV.	ZONE	ECO #	REVISION	APPD
A		M-736	INITIAL RELEASE	
B		M-806	COMPLETE UPDATE	

063-0132-B

SH 1 OF 10

TOLERANCES
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
DECIMALS .X ± ____
.XX ± ____
.XXX ± ____
ANGLES XX.X ± ____
FRACTIONS ± ____
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.

DRAWN BY E. Gutkin DATE 8/82
CHECKED BY A. Garcia DATE 8/82
APPROVED BY DCC DATE A.J. Adams 8-11-82
RELEASED BY DATE BM Gardner 9/82

apple computer inc.

TITLE
FINAL FUNCTIONAL TEST PROCEDURE
APPLE //e

MATERIAL: ____

SIZE A | DRAWING NUMBER 063-0132-B

NEXT ASSY. | FINISH: ____ | SCALE: ____ | SHEET 1 OF 10

1.Ø TITLE

FINAL FUCTIONAL TEST PRDCEDURE - APPLE IIe SYSTEM

2.Ø TEST EQUIPMENT AND SUPPLIES

2.1 P/N 889-ØØ26 Functional test diskette
2.2 P/N 821-ØI9Ø Functional test card with cables

2.2.1 Functional test card to be modified and calibrated as described in appendix A

2.3 P/N 821-Ø189 Slot tester card

2.3.1 Slot tester card to be modified as described in appendix A

2.4 Amdek or equivalent, Color Monitor
2.5 P/N 89Ø-5Ø15 Modified video cable for color monitor
2.6 Monitor III or equivalent, black and white monitor with cable
2.7 Phillips 6661 or equivalent, frequency counter with cable
2.8 P/N A2MØØ3 APPLE disk II
2.9 P/N 65Ø-41Ø5 Disk II interface card
2.1Ø P/N 6Ø7-Ø1Ø2 APPLE IIe 1K 8Ø column card

3.Ø ALIVE TESTS

3.1 Plug the power supply cable into the computer.

3.2 Connect the monitor cable to the video connector located at the right rear of the board.

3.3 Connect the modified video cable to the MODULATOR connector (J13) located near the right rear of the logic board.

3.4 Turn on the power supply switch.

3.5 The following should happen immediately:

The "POWER ON" LED should light.

The "PDWER ON" indicator on the keyboard should light.

The speaker should beep once.

The monitor should display "Apple II" at the center top of the screen.

The Applesoft prompt, "]", and a blinking cursor should appear on the left side of the display one line below Apple II.

3.6 If any of the things listed in section 3.5 didn't happen, mark the traveler according to this list:

No beep and no "Apple II" --- NO RESET
"Apple II" and no beep --- SPEAKER
LED not on --- CR1 BAD

If any other things happen besides what is listed in 3.5, mark the traveler "POWERUP FAIL" and send the system to rework.

3.7 Press the CONTROL and RESET keys at the same time. When you let go of the keys you should hear a beep and the Applesoft prompt and a blinking cursor should appear at the lower left of the monitor. If this doesn't happen, label the traveler "MANUAL RESET" and send the system to rework.

3.8 Press the RETURN key and hold it down. After about one second you should see a column of "]" characters appearing down the left side of the screen. If these characters don't appear then label the traveler "REPEAT FAIL" and send the system to rework.

3.9 Press the CONTROL, RESET and CLOSED APPLE keys all at the same time. Release the RESET key first and the board will run a self test that will take about 10 seconds to finish. If any message other than "KERNEL OK" is displayed, write the message on the traveler and send the system to rework.

3.10 TURN THE POWER SUPPLY OFF.

4.0 SLOT TESTING

4.1 Insert the functional test card into slot four (4) and connect the frequency counter cable to the counter.

4.2 Insert the slot tester card into slot seven (7).

4.3 Turn the power supply switch on.

4.4 The monitor should display "TESTING SLOT #7" immediately. If the monitor displays the message CAN'T FIND A SLOT CHECKER then turn the power off, reseat the slot checker and power on again. The test will take about one second to finish and then the message "SLOT OK" should be displayed. If any other message is displayed, copy that message onto the traveler and send the system to rework.

4.5 TURN THE POWER OFF.

CAUTION: DO NOT REMOVE CARDS WITH POWER ON!

4.6 Remove the slot checker card from slot seven (7) and insert it into slot six (6).

4.7 Turn the power supply switch on.

4.8 The monitor should display the messages like in section 4.4 except the slot number will be six (6).

4.9 Repeat the slot check sequence:

TURN THE POWER OFF

INSERT THE SLOT CHECKER INTO THE NEXT SLOT

TURN THE POWER ON

For slots five (5), three (3), two (2), and one (1). If on all the slots the message "SLOT OK" was displayed, the slot test section has passed. If a slot fails label the traveler with the failure message and send the system to rework.

4.10 Check the system frequency displayed on the frequency counter. If the frequency is not within the following limits, label the traveler "7M BAD" and send the system to rework.

Frequency range: 7.158840 - 7.159340 MHz

4.11 TURN THE POWER SUPPLY OFF.

4.12 Remove the slot checker card from slot one (1).

5.0 BOOT DISK DRIVE TEST

5.1 Connect the cassette cables from the final test card to the cassette jacks on the right rear of the logic board. (Functional test card IN to logic board IN, and OUT to OUT.)

5.2 Connect the functional test card DB9 connector to the DB9 connector at the right rear of the logic board.

5.3 Connect the remaining cable, the DIP I/O, to the game paddle socket at the right rear of the logic board.

5.4 Insert the 80 column card into the Aux slot at the left front of the board.

5.5 Insert the disk interface card, which should be connected to the drive, into slot six (6).

5.6 Insert the functional test diskette into the disk drive and close the door.

5.7 TURN THE POWER ON.

5.8 The following should happen immediately:

The system should beep.

The message "Apple II" should be displayed on the monitor.

The disk drive "IN USE" light should light.

5.9 If after 7 seconds the message "EXECUTING I/O TESTS" or the first video test screen does not appear, label the traveler "ND BOOT" and send the system to rework.

6.Ø CASSETTE AND GAME I/O TESTS

If a failure happens here, the monitor will print "ERROR" and then a code. Write the code on the traveler and send the system to rework.

7.Ø VIDEO TESTS

7.I The first video test is a color test. Make sure that the colors on the color monitor are the same as the names.

This test fails if any of these things happen. (Mark the traveler VIDEO FAIL.)

One of the colors on the monitor is not right.

The colors are washed out.

The color names aren't there.

There are lines moving through the display.

7.2 Press the space bar to display the next test. This test is a pattern of colors. This test fails if any of these things happen. (Mark the traveler VIDEO FAIL.)

You can't get the pattern to appear.

The pattern doesn't go all the way to the bottom of the screen.

There are lines moving through the display.

7.3 Press the space bar to display the character generator test. Look at the black and white monitor during this test. This test fails if anything except the little box is flashing. (Mark the traveler VIDEO FAIL.)

7.4 Press the space bar to display the next test. This test will display five colored lines. Fail this test if any of these things happen. (Mark the traveler VIDEO FAIL.) You should look at the color monitor during this test.

The colors are wrong or washed out. The colors should be in the following order from top to bottom.

GREEN
PURPLE
WHITE
RED
CYAN BLUE

NOTE: Cyan is a greenish blue.
There is anything besides the five lines on the screen.

7.5 Press the space bar to display the next test. Fail this test if any of these things happen. (Mark the traveler 8Ø COL FAIL.) Look at the black and white monitor.

There are only forty columns displayed.

There are spaces between the numbers on the number lines.

The numbers read Ø2468 or 13579 and not 12345.

The letters are blurred, not crisp at the edges.

7.6 Press the space bar to go to the keyboard test.

8.Ø KEYBOARD/KEYBOARD ENCODER TEST

8.1 Make sure the CAPS LOCK key is in the DOWN position.

8.2 You should see letters and numbers on the display now arranged like they are on the keyboard. To do this test you must press each key on the keyboard and make sure that the same key on the display is erased.

There are several error messages you will find during this test.

ONE BEEP ... Means that key has been pushed before. The one beep message may mean that you have made a mistake OR it may mean that you pushed a key and the computer thought it was a different key.

FOUR BEEPS . Means that a key was pressed that isn't in this test. This message could mean that you made a mistake and pressed the wrong key OR the computer

thought you pressed a different key.

BDUNCE ..... This message will be printed on the monitor at the bottom of the display in inverse video. (black on white) It will say:

BOUNCE OETECTED ON <the key>

The best way to do this test is to look at the keyboard and press all of the keys until you are done or hear a beep or beeps. While you are doing characters that require the shift key to be pressed make sure that you have used both shift keys at least once. If you get through all of the keys without hearing beeps then look at the display and make sure all of the keys were erased. If they are and there isn't a bounce message then press the space bar and go to the next test.

If you hear the single beep message then press the key again and look at the current key display at the top of the screen. If the display is the same as the key you just pressed then continue as that key has been accidently been pressed twice. If the key is different that the display then mark the traveler BAD DECODE <the key> and send the system to rework.

If you hear the four beep message and you are pressing a key that is on the display then label the traveler BAD DECODE <the key> and send the system to rework.

If you got all the way through the keyboard without messages but you can't get a key to disappear from the screen then mark the travel[illegible] NO DECODE <the key> and send the system to rework.

If you see the bounce message on the monitor then label the traveler BOUNCE ON <the key> and send the system to rework.

B.3 You should now be at the lower case test. Make sure that the CAPS LOCK key is in the UP position. This test works just like the last test except you will be typing in lower case letters. Also use the same messages on the traveler. Press the spacebar to go to the next test if there were no errors.

B.4 You should now be at the control character test. This test will display the keys in inverse video. (black on white) Again this test works just like the first test EXCEPT:

For the first line of keys (Q through P) hold down the CONTROL key while pressing the keys.

For the second row of keys (A through L) hold down both the CONTROL and left SHIFT keys.

To do the third row of keys (Z through M) push the CAPS LOCK key to the down position and then hold the CONTROL key down while pressing the keys.

Use the same messages as in 8.2 for errors. Press the spacebar to go to the next test if there were no errors.

8.5 You should now see the miscellaneous keys test on the display. This test will display words on the screen. Press the key described by the word to make the word disappear. Use the same messages that are described in section 8.2. If there were no errors then press the spacebar to go to the next test.

8.6 The display should now say PRESS OPEN APPLE. The open apple key is the key just to the left of the spacebar. When you press the open apple key you should immediately see PRESS CLOSED APPLE appear on the next line. If this message does not appear on the display then mark the traveler OPEN APPLE and send the system to rework. If the message PRESS CLOSED APPLE appears then press the key to the right of the spacebar. If the message TEST COMPLETE does not appear then label the traveler CLOSED APPLE and send the system to rework.

9.Ø YOU'RE DONE

The message TEST COMPLETE should be displayed on the monitor now. TURN THE POWER OFF and disconnect the test equipment.

Appendex A

1.Ø SLOT TESTER CARD MODIFICATIONS

The following edge connector fingers should be removed from the Slot Tester Card:

Connector pin	Signal name
19	CLKEN*
21	RDY
22	DMA*
23	INT OUT
24	DMA OUT
27	DMA IN
28	INT IN
32	INH*
33	-12C
34	-5C
35	ENKBD*
36	7M
39	UPSYNC
5Ø	+12C

In addition, The following LEDs should be removed:
CR2, CR3, CR4

2.Ø FUNCTIONAL TEST CARD MODIFICATIONS

The following edge connector fingers should be removed from the Functional Test Card:

Connector pin	Signal name
19	CLKEN*
21	RDY
23	INT OUT
24	DMA OUT
27	DMA IN
28	INT IN
32	INH*
33	-12C
35	ENKBD*
37	Q3
39	UPSYNC
5Ø	+12C

In addition, The following LEDs should be removed:
CR3, CR4

3.Ø FUNCTIONAL TEST CARD CALIBRATION

The Functional Test Card Calibration Procedure consists of the following two steps only:

3.1 With the test card installed in slot four and the cassette cables disconnected, adjust POT P1 for zero Volts plus or minus 1Ø mV observed at U18 pin 6.

3.2 Lock the pot P1 into place using a compound made for that purpose.